

Vol. 11

TAMPA, FLORIDA, FEBRUARY, 1930

No. 2

Soil Acidity and Citrus Grove Fertilization

Soil
By E. L. Lord, Professor of Horticulture, College of Agriculture, University of Florida

It is very difficult to convince the fruit grower that some of the problems which affect the production of fruit may be traced to the reaction of the soil in which the trees are growing. Unfavorable conditions that may be attributed to soil acids or bases may often be easily alleviated as soon as the cause and treatment are understood and applied.

In collaboration with many growers, I have been spending quite a portion of my free time for several years in trying to get at the soil conditions which may cause improper tree responses, such as abnormal growth and fruiting; and it is my belief that troubles of this character are more common in Florida than in most States, although these troubles are rarely traced to their true source.

In consequence of this condition it is apparent that everyone who wishes to be a successful citrus grower should study carefully the factors which influence soil reaction, and the means by which it may be brought into a closer harmony with the needs of the plant. While it is true that the citrus tree will grow on soils of a wide range of acidity, still it is also true that heavy annual production of good quality fruit is impossible unless the reaction is near the optimum



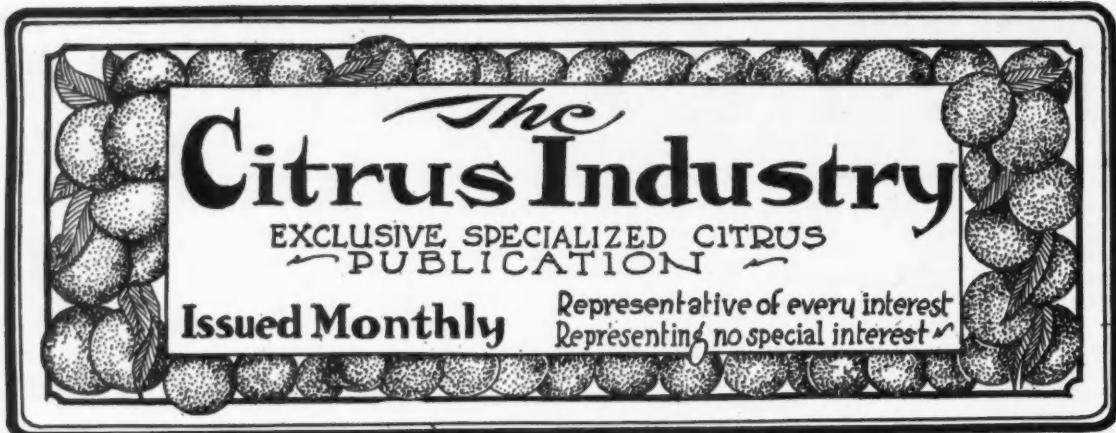
Prof. E. L. Lord

of the tree. In other words, unless the soil reaction is only slightly acid or nearly neutral, the citrus tree will be neither happy nor profitable to the owner.

Now it is a fact that the soil of Florida is exceedingly uneven; in the same grove it is possible to find

acid, neutral and very alkaline soils. This is shown easily by simple tests, and it is also shown in the tree behavior. Such portions of the citrus grove need radically different treatments, but usually get the same treatment. With this same treatment the trees give widely different responses; some trees are seriously injured, while others are as plainly benefitted. A wider knowledge of the condition of the soil in which the tree is growing and the effect of the various soil amendments, such as fertilization, liming, drainage, and tillage, on the soil condition would prevent many mistakes which are costly to the citrus grower.

While the vegetation which covered the soil before the trees were planted, as well as the natural vegetation in the grove, are to a certain extent indicators of the former or present reaction of the soil, the grower cannot depend too much upon such evidence, as the fertilizer which has been applied usually has altered the reaction very materially. In one case with which I am acquainted the grower in seven years altered an originally neutral soil to such a degree that it is well capable of growing blueberries (which prefer a very high degree of acidity)—and it is needless to say that the citrus



Vol. 11

TAMPA, FLORIDA, FEBRUARY, 1930

No. 2

Soil Acidity and Citrus Grove Fertilization

Soil
By E. L. Lord, Professor of Horticulture, College of Agriculture, University of Florida

It is very difficult to convince the fruit grower that some of the problems which affect the production of fruit may be traced to the reaction of the soil in which the trees are growing. Unfavorable conditions that may be attributed to soil acids or bases may often be easily alleviated as soon as the cause and treatment are understood and applied.

In collaboration with many growers, I have been spending quite a portion of my free time for several years in trying to get at the soil conditions which may cause improper tree responses, such as abnormal growth and fruiting; and it is my belief that troubles of this character are more common in Florida than in most States, although these troubles are rarely traced to their true source.

In consequence of this condition it is apparent that everyone who wishes to be a successful citrus grower should study carefully the factors which influence soil reaction, and the means by which it may be brought into a closer harmony with the needs of the plant. While it is true that the citrus tree will grow on soils of a wide range of acidity, still it is also true that heavy annual production of good quality fruit is impossible unless the reaction is near the optimum



Prof. E. L. Lord

of the tree. In other words, unless the soil reaction is only slightly acid or nearly neutral, the citrus tree will be neither happy nor profitable to the owner.

Now it is a fact that the soil of Florida is exceedingly uneven; in the same grove it is possible to find

acid, neutral and very alkaline soils. This is shown easily by simple tests, and it is also shown in the tree behavior. Such portions of the citrus grove need radically different treatments, but usually get the same treatment. With this same treatment the trees give widely different responses; some trees are seriously injured, while others are as plainly benefitted. A wider knowledge of the condition of the soil in which the tree is growing and the effect of the various soil amendments, such as fertilization, liming, drainage, and tillage, on the soil condition would prevent many mistakes which are costly to the citrus grower.

While the vegetation which covered the soil before the trees were planted, as well as the natural vegetation in the grove, are to a certain extent indicators of the former or present reaction of the soil, the grower cannot depend too much upon such evidence, as the fertilizer which has been applied usually has altered the reaction very materially. In one case with which I am acquainted the grower in seven years altered an originally neutral soil to such a degree that it is well capable of growing blueberries (which prefer a very high degree of acidity)—and it is needless to say that the citrus

February, 1930

THE CITRUS INDUSTRY

Five

trees showed marked distress. If the grower had fed lightly instead of heavily this response would have been longer in appearing, but it would have been there just as surely. In another case the grower applied as a top-dressing a generous amount of nitrate of soda to his grove; unfortunately some of his trees were on a soil that was very alkaline. The trees on this soil were badly damaged while trees a few hundred feet away on an acid soil grew vigorously and produced heavy crops. These trees were of the same variety and on the same rootstock, but until the reaction of the soil was ascertained there was no clue to the markedly difficult response.

What are the conditions which are produced in a citrus tree by an unfavorable soil reaction? It is easier to recognize them in the grove than to describe them. The alkaline soils (those in Florida are usually those containing an excess of lime) cause a chlorosis or mottle leaf, usually called "frenching" here in Florida. On soils with such a reaction it is difficult for the tree to obtain the calcium and iron that is necessary for normal leaf growth. To some extent such a condition at times may be alleviated by the use of fertilizers which slowly increase soil acidity and which have little toxic effect. The addition of large amounts of organic matter to the surface of the soil, keeping this organic matter in such a form that it will decay very slowly not incorporating it with the soil, will also help such trees.

Some frenched trees will also be benefitted by the application of calcium nitrate or nitrate of lime. Apparently if this is applied evenly where there is plenty of moisture the tree takes up the lime directly with the nitrogen. At least there is no doubt of the fact that such trees are benefitted by calcium nitrate as well in Florida as they are in California. Other nitrates do not have this effect but increase the damage brought about by the excess of lime. It may sound peculiar to use a fertilizer containing lime where there is an excess of lime, but there is no doubt that the more alkaline the soil is, the more difficult it is for the tree to obtain the lime necessary for its growth from the soil. It has been shown on many plants, including the citrus tree, that as the alkalinity is increased the leaves become more and more deficient in calcium. Evidently the citrus tree is able to obtain the calcium it needs from the calcium nitrate when it is unable to obtain it from the soil solution before the calcium nitrate is applied. When the alkaline soil is

made neutral by slowly acid-forming fertilizers, such as urea, the trees will show a distinct gain in color and growth. Strongly acid-forming fertilizers, such as sulphate of ammonia, should only be applied sparingly, even if the soil is alkaline, as even in the presence of calcium carbonate applications sufficient to neutralize the soil are very toxic to citrus trees. A very peculiar effect, brought about by the calcium starvation in a citrus tree caused by attempting to grow the tree in calcareous soils, is found in the fact that grapefruit (which has a much lower need for calcium than oranges) will grow and produce luxuriantly on soils that keep an orange tree in a sadly frenched condition. On marl soils the sour orange rootstock does not send up sufficient lime to keep the foliage of an orange tree in good health, but a grapefruit too will thrive on such soils if they are not too alkaline.

What are the effects brought about in the citrus tree by attempting to grow it on soils that are highly acid? Much if not all of the so-called die-back or citrus exanthema, is traceable to this cause. The splitting of fruit is directly traceable to soil acidity. As it is difficult for the tree to take up calcium or iron when it is growing on a soil which is too alkaline, so it is also difficult for the tree growing on too acid a medium to obtain the potash or phosphorus which it may require. The greater the acidity the more difficult it is for the tree to obtain these elements. If it is kept in mind that healthy growth and full production of the citrus tree are dependent upon getting all of the elements required in the correct proportion to make new tissue, whether it is wood or fruit, and that the tree is unable to get them in such a proportion except when they are found in the soil, and the soil is of such a reaction that the tree can take them up, the importance of getting the tree on soil of the proper reaction will not be underestimated. The splitting of Valencias may be caused by a potash deficiency but it is not necessarily a deficiency in the soil, but in the plant. Heavy fertilization with nitrogenous sources may bring on die-back, but it is much more serious where the soil reaction is such that the necessary potash is not taken up by the tree. If potash is needed by a citrus tree it is not enough to apply it to the soil, it is also necessary to bring the soil near enough to a neutral condition so that the tree is able to obtain sufficient potash for its needs. Each kind of tree has a favorite soil reaction at which it obtains the plant food it needs in the proper

proportion for growth and production, and any variation from this affects the tree unfavorably. The citrus tree is no exception, requiring for best performance a reaction which is very slightly acid or nearly neutral. Soil on which cabbage palmetto has grown thickly is usually nearly neutral. Many of the light soils of the Norfolk series are also approximately in a neutral condition. If these soils are fed a fertilizer containing a large amount of acid forming materials, the Norfolk soil will as a rule change rather slowly, and cannot hold a very high degree of free acid, because of the loss caused by the downward movement of the soil solution. The hammock soil will under the same conditions change rather rapidly because the organic matter will tend to hold the acid forming elements in the soil. Under such conditions there may be such an accumulation that the tree will be badly injured. The fruit will split and become "ammoniated" and the trees show all the traditional symptoms of die-back. Soils which have had a heavy growth of saw palmetto are often very acid, and will give the same effect even in a much shorter time. Trees in such condition should receive light applications of wood ashes or granular limestone so that the acidity may be slowly corrected. Rapid change in the soil reaction by the use of finely ground limestone should be avoided, as it is very injurious to the soil. On the lighter soils lime is often very injurious to the soil. On the lighter soils lime is often very injurious for the low water-holding capacity of such soils greatly increases the effect. Heavy application of mixed fertilizers usually rapidly increase soil acidity, not because of the acid phosphate, as is commonly supposed, but because the nitrogen content is usually derived to a large extent from sulphate of ammonia which is a rapid acid-forming fertilizer. One pound of sulphate of ammonia will remove from the soil about 1.2 pounds of lime. If it is remembered that the orange often carries away from the soil more lime than potash, it is easy to see why old groves that have been fed for years with fertilizers containing large amount of sulphate of ammonia, from which heavy crops of fruit have been removed, usually show an appalling deficiency of calcium in the soils.

From what has already been said it is easy to conclude that no one can intelligently fertilize citrus trees if he is unaware of the soil reaction of the soil in which that tree is growing. It is particularly important for the

Continued on Page 24

1830-The Tale of Nitrate of Soda=1930

(Research Department Chilean Nitrate of Soda Educational Bureau)

The year 1930 marks the 100th anniversary in the use of nitrate of soda in the United States, and it also represents the opening of a new era in the Chilean nitrate industry. With the exception of lime and marl, this nitrogen fertilizer has probably been utilized the longest of the inorganic substances now commonly used for agricultural purposes.

Since the opening of the Panama Canal in 1914, approximately 27,500,000 tons of Chilean nitrate have been carried through it, paying at least \$13,500,000 in shipping tolls into the treasury of the United States. It is conservative to estimate that each dollar invested in Chilean nitrate of soda has returned itself and another to the farmers who have used. On that basis, United States farmers have enriched themselves by at least \$937,000,000 since 1830.

In its natural state, nitrate of soda is found in a stratified ore called caliche. It occurs only on a barren plat-

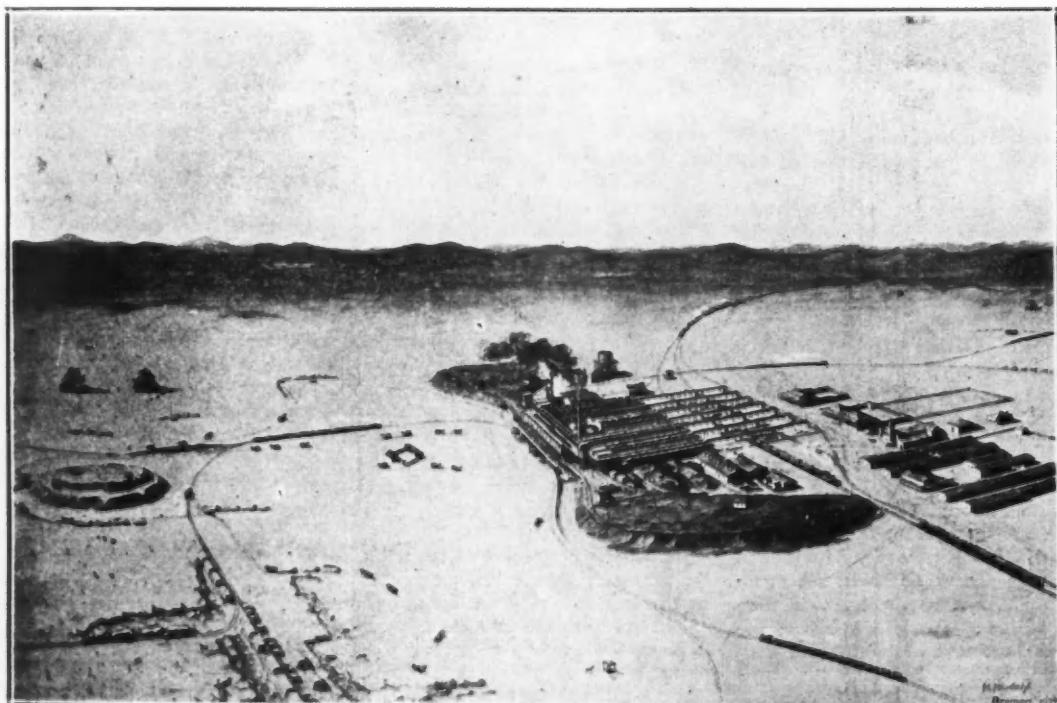
eau in the Andes mountains of northern Chile, in an area that is about 450 miles long and which varies from 15 to 90 miles in width. The nitrate zone is as desolate as a desert, for it is entirely destitute of vegetation, water, and fuel. The principal layers of caliche are found about three feet below the surface. It varies in richness from 5 to 70 per cent of sodium nitrate.

The extraction of this raw material is comparatively simple. The surface is broken up, usually by dynamite. In some instances steam or electric shovels are used for removing the layers of the earth covering the caliche and also for extracting the caliche itself. In other cases more primitive methods are used, even hand drilling, although these have been largely replaced by mechanical drills. The raw material thus mined is transported to a central refining plant. This is done by means of mule-drawn carts and light

railways with steam locomotives. At the central plant the caliche is first crushed and then leached into huge evaporating pans. The recovery of the nitrate follows, after which the product is dried, sacked, and loaded on the cars for transportation.

A nitrate plant is known as an "oficina", though this term is sometimes restricted to the works. Actually, an "oficina" means not only the central plant where the raw material is precipitated and leached, but the complete establishment — the area which is being mined, the railway and other transportation equipment, the administrative offices, the model dwellings erected by the companies for the operarios, or workers, and the whole industrial community. About 70 oficinas are now in operation.

The nitrate industry has recently gone through a period of transformation which has helped very materially to eliminate waste and to assure



Bird's Eye View of a Nitrate Oficina. The huge nitrate plain is as barren as a desert, a fact which greatly complicates the mining and the refining of nitrate of soda. At the left, the caliche is being mined and transported on small railways to the oficina. At the right are the administration buildings and the homes of the workers. A train of the fertilizer, in the far right, is headed toward the coast, from which it will be shipped to farmers in all parts of the world.

February, 1930

greater economic efficiency.

Recently a new process has been introduced into the industry on a large scale by American capital. It recovers about 90 per cent of the nitrate contained in the ore, as compared with about 55 per cent under the old process. In addition it permits the treatment of ore averaging as low as 8 per cent sodium nitrate, contrasted with 15 per cent required under the old methods. By this step, alone, this new process has doubled the life of the deposits in Chile, for prior to its introduction, low-grade ore was cast aside and only the selected, high-grade material was treated.

The American capitalists now have in operation a plant based upon the American idea of mass production. It produces 500,000 tons of nitrate of soda annually, as against 150,000 tons which represents the maximum production of the largest plant using the old methods. Every operation in this new plant typifies the latest American methods. Large electric shovels are used for stripping the over-burden from the ore and loading the ore into the railroad cars. The railroads have been electrified, and the machinery and equipment used in crushing and leaching the ore and in recovering the nitrate of soda from the solutions represents the last word in American efficiency. As a result, one laborer working under this

THE CITRUS INDUSTRY

new process replaces three to four under the old, and one ton of fuel oil does the work of four to five tons under the old methods.

The product from this process is a pure white nitrate of soda containing about 99 per cent sodium nitrate. It is in the form of even-sized, shot-like granules, which may be easily applied to the field. Costs have been materially reduced, as against the old methods, which in the end will mean steadily lowering prices for nitrate of soda to the consumers in the United States.

In connection with the refining process, iodine, another valuable constituent of the caliche, is also obtained for commercial purposes. Small quantities of iodine, as well as manganese and boron, are present in the refined nitrate of soda.

As found on the market, Chilean nitrate of soda ranges from red and dull grey to pure white in color, and is uniformly fine in texture. It is immediately soluble, one part dissolving in one part of water. It contains from 96 to 99 per cent sodium nitrate and more than 15 per cent elemental nitrogen. In this form it may be applied directly to crops or be used in a mixed fertilizer with equal facility and effectiveness.

Among American farmers, nitrate of soda is known by various names, such as Chile saltpeter, "soda", Chil-

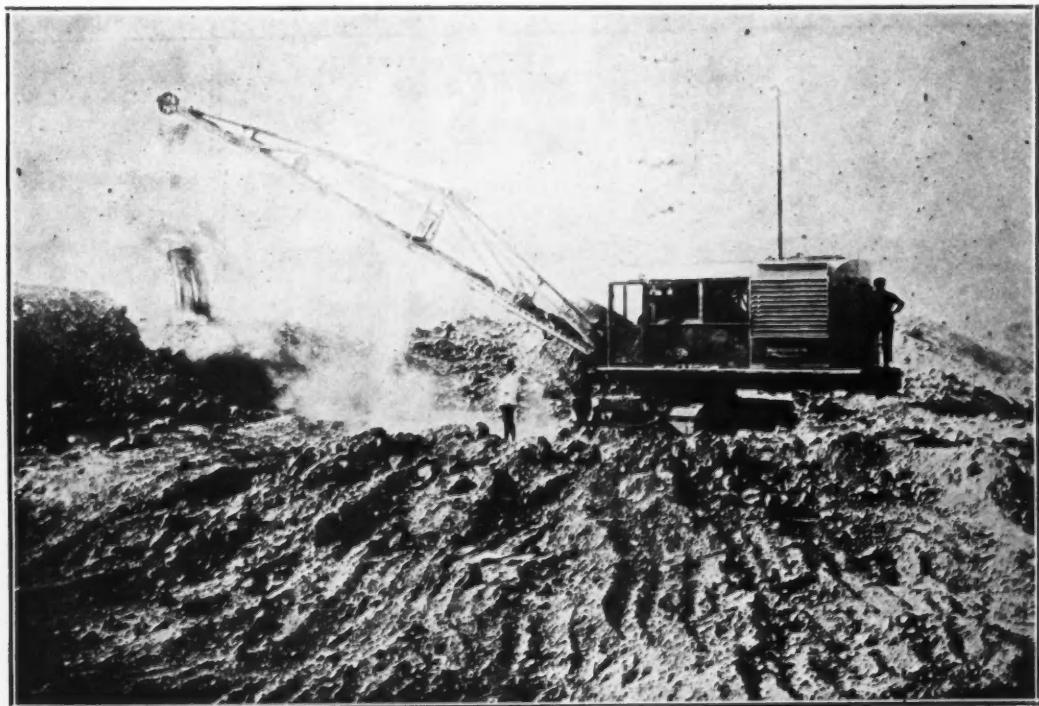
LIBRARY
JACKSONVILLE, FLA.

ean Nitrate, and to some extent in the Southern States as "guano".

Original Mine.—In 1818, George Smith, an Englishman, near Iquique, then Peru, opened on a commercial scale the first nitrate of soda mine. Two years later, small quantities were shipped to England, but were dumped overboard because of the high duty. In 1827, efforts were again made to introduce it into Europe, but without success.

First Importation.—One ton was delivered in New York in 1830, but, as its value was unknown, no sale was found for it. Shipments to both England and France were made the following year, nearly 8,000 tons being exported.

Nation Rural to Its Heart.—One hundred years ago America was rural to its heart. The total population of the young republic was less than 13,000,000. Less than a million lived in towns of 8,000 or more population. Twenty-four States comprised the Union. In Georgia the Creeks and the Cherokee Indians were still roaming their hunting grounds, and in Florida the Seminoles were living in the Everglades. Only pioneers had penetrated the vast region beyond the Mississippi. Texas, California, and all of the Southwest were under the rule of Mexico. Cincinnati was the "metropolis of the West," with a population of 25,000. Because of its large



Modern Equipment Used In The Nitrate Industry—the last word in American mechanical ingenuity can be seen in the most modern oficinas. This picture shows the crude ore, caliche, which occurs, on the average, about three feet below the surface.

THE CITRUS INDUSTRY

Orchard Heater

February, 1930

pork establishments, it was then known as "Porkopolis." Chicago consisted of only a fort and a few houses. As late as 1840 its population was less than 5,000.

A picture of early farm life in America has been preserved for us by C. W. Marsh, inventor of the Marsh harvester, who in "Recollections of 1837 to 1910" describes conditions on his father's farm in Ontario.

Oxen did the plowing, dragging, and logging, writes Mr. Marsh. Horses did the lighter hauling on the farm and on the road. Plows, made by the local blacksmith, consisted of a wooden moldboard with an iron or steel share. They turned the furrow slice on edge but not over. Sowing was done by hand, broadcast. Corn was dropped by hand in shallow furrows made by the plow and then covered by a hoe. There were no carriages. Wagons, sleighs, and other equipment were made by a country wagon maker and blacksmith. The entire outfit of implements needed on the farm, excepting the fanning mill, did not cost \$25 in cash. In short, the methods and implements were but little in advance of those of ancient Egypt and Rome.

New View of Fertilizers.—Results of tests with fertilizers were summarized by the Albany Cultivator in 1844. "A singular idea has just been suggested in Scotland," it reported,

"in relation to the nutrition of plants. It may be summed up in a few words, thus that a sufficient quantity of the elements of nutrition may be absorbed in the seed of wheat, oats, barley, &c., to ensure a very large product at harvest, without any other manure. Experiments have been made with complete success, and they have been published by the Agricultural Society of Scotland." Nitrate of soda was used in these experiments.

Consumption High.—In 1830 but one ton of nitrate was used in this country; in 1900, 160,000 tons; in 1910, 592,672; in 1914, 606,721; in 1926, 1,033,702, and in 1928, 1,114,337 tons.

European farmers too, find it equally profitable. In 1927, France consumed 233,687 tons; Spain, 159,978 tons; Holland, 83,341; Belgium, 74,956; Great Britain and Ireland, 70,856 tons. Egypt used, during the same year 172,510 tons.

Recent reports from Germany indicate that the demand for the natural nitrate has increased more than 500 per cent during the past three years. Sales of Chilean nitrate during 1928-29 amounted to 99,083 tons, as compared with 16,400 in 1926-27 and 48,360 tons in 1927-28.

Happy is the farm dweller who besides making his living on the land, "finds tongues in trees, books in running brooks, sermons in stones."

GROVE HEATING IS JOB THAT REQUIRES CORRECT EQUIPMENT

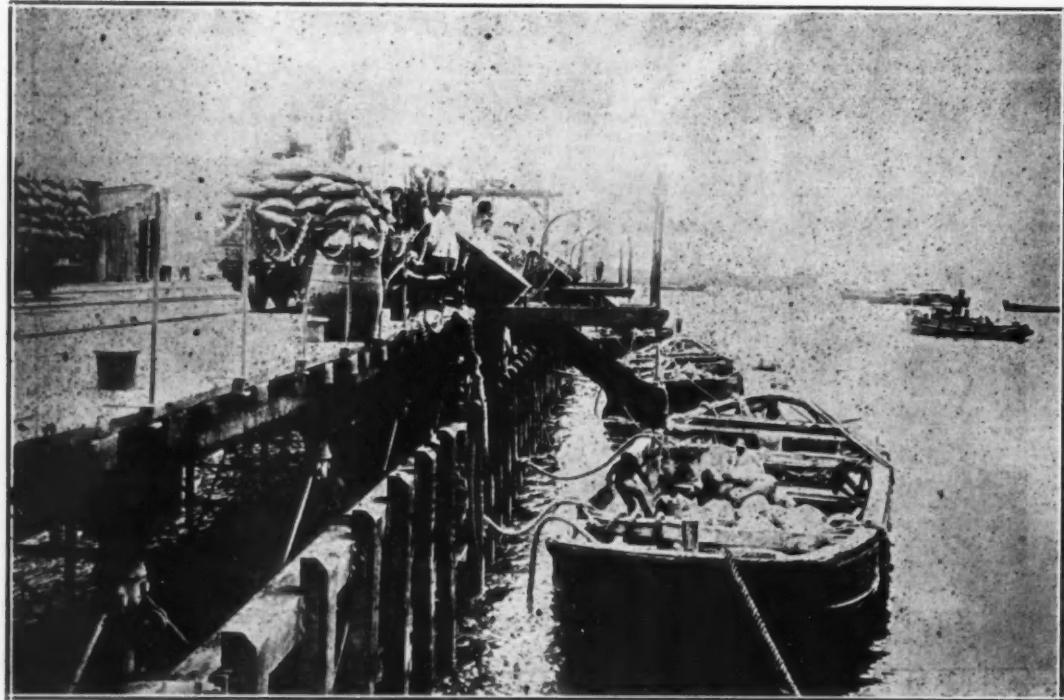
Successful grove heating is a job that calls for a lot of care and the use of correct equipment, stated Dr. A. F. Camp, horticulturist of the Florida Experiment Station. It is perhaps true that more failures in grove heating have resulted from improper methods than have occurred from anything fundamentally wrong with the heaters, he said.

Many growers who have purchased heaters have failed to secure plenty of good thermometers adapted to grove heating work, and many others have failed to mount their thermometers in the right way. The best type thermometer for this use is that which has a minimum recording device. It is also important that it be accurate at temperatures below 32 degrees.

In mounting thermometers in the grove protect them from direct exposure to the sky, as this is likely to cause them to register a lower temperature than the actual air temperature due to losses of heat by radiation. A suitable shelter may be made for the mounting by constructing a box with top and bottom but no sides.

Thermometers are the guide to proper grove heating and should be read frequently and the readings

Continued on page 21



Tugs carry the Nitra of Soda to Ships in a Chilean Harbor

ENT
job
the
Dr.
the
per-
rove
oper
rom
withased
enty
to
thers
com-
type
that
de-
be
32the
ex-
y to
em-
era-
dia-
ade
g a
des,
to
be
ngs

THE DISCOVERER OF THE BLUE GOOSE: Mr. J. Dewey Soper with a friend in the tundra country of Baffin Land. On left: THE PRIZE: On right: THE BLUE GOOSE'S IMPRESARIO—MR. GEORGE EDWARDS, WHO INTRODUCED IT TO SCIENCE: This picture was taken from Edwards's Volume on Rare Birds in the library of the Royal College of Physicians.

A TWO-CENTURY Blue Goose CHASE: Described by ETHEL I. MASON

Blue Goose

Reprinted from the internationally famous publication, *THE SPHERE* of London, issue of October 26, 1929, to which credit is acknowledged also for the photographs reproduced herewith.

A wild goose chase that lasted for upwards of two centuries, and baffled the scientists of both the Old World and the New, has just been reported as ended with the final discovery of the breeding-grounds of the Wild Blue Goose in Baffin Land. But it was to an English artist, George Edwards, sometime library keeper of the Royal College of Physicians, that Science owed its acquaintance with that elusive wildfowl.

Approximately 500 fine specimens of rare birds had been collected by Edwards during his wanderings about the highways and by-ways of Holland, France, Norway, and elsewhere, prior to his settling down to his duties in London in 1733. Many gifts of unknown or unique birds were brought him from abroad, and particularly from North America, which was just then being opened up as a paradise to the collectors of all manner of flowers, fauna, and rare birds.

One of the gems in his collection was a bird presented him by a Mr. Isham from Hudson Bay. In his magnificent book, with its coloured plates, which appeared about 1750, entitled *A Natural History of Uncommon Birds*, the new goose was shown with a bright blue wing, from which he gave the name the Blue-Winged Goose. Linneus, the famous Swedish naturalist, later listed it as the *Chens caeruleostris*.

Curiously enough, the intensive search for the nest and eggs of this rather rare wildfowl became of importance to science because of the similarity of the immature Blue Goose with the young Snow Goose, in whose company it was often found. The latter bird, whose Latin name



WHERE THE BLUE GOOSE MAKES ITS NEST: Fox Basin, Baffin Land.
"A Canadian scientist, J. Dewey Soper, after a year spent in the barren wastes of Baffin Land, has solved another ornithological mystery; he has discovered where the Blue Goose nests. Never before has the habitat of the Blue Goose (*Chen caeruleostris*) been discovered. The birds winter down in Louisiana, and as far south as Mexico, but migrate to the Arctic for the summer. For many years naturalists have been trying to solve the mystery of their habitat and habits, but failed until this young Canadian shook off civilization and lived alone in the Arctic. The Blue Goose nests in Fox Basin on the west coast of Baffin Land. Mr. Soper studied the birds in their native haunts, took photographs of birds and nests and brought some of the eggs to Ottawa with him. The photographs reproduced herewith are the first ever taken of a Blue Goose's nest and a Blue Goose's eggs in the wild. For years museums have offered rewards for such eggs and for the location of the breeding-places of the Blue Goose. Eggs and the downy young of the Blue Goose have never hitherto been found in the wilds, though there have been a few raised in captivity. The patient, gentle Canadian scientist became so intimate with the birds that he took photographs of them actually on the nest or walking near him. When the Blue Goose leaves Baffin Land on the autumn migration they cross the Hudson Straits, linger in and around the James Bay country, and then take off in a long flight down the Mississippi Valley. Their greatest winter concentration extends from Sabine to the Mississippi River delta."

means "Back of the North Wind," is quite common in and around Hudson Bay and along the west shores of James Bay, from which region the original specimen sent to Mr. Edwards was discovered.

Nothing was known of the nesting habits of the Blue Goose, and when in due course it became apparent that no one had ever been able to locate the young or the eggs of this elusive bird, many eminent ornithologists began to doubt that it even existed as a separate species.

During the 125 years that followed the publication of Edwards's book in London, naturalists had learned a great deal about the birds of North America. But they were unable to learn very much, if anything, about the Blue Goose. This fact alone whetted their interest, and it is no exaggeration at all to say that in the whole course of ornithological history there has seldom been a prize more eagerly sought than the nest of the wild Blue Goose.

By the early 'eighties scientific interest in the matter was acute. Many eminent naturalists were ranged on the side of the faction that spoke only of "Blue-snow Geese," because of their opinion that these birds were merely a colour phase of the Snow Goose. Other schools of thought declared that there was a distinct and separate species, and from the old-time folios at the Lenox Library in New York it is obvious that at the ornithological meetings of that day many bitter battles were fought over this moot question.

Every expedition that went up into Canada on any errand whatsoever kept an eye open to locate the nest, and Hudson Bay trappers, Indian guides, Eskimos, and Government experts of both the Dominion and the United States made many a fruitless hunt. They wandered up and down the McKenzie River. They combed the tundras of Ungava. They scoured the shores of Baffin Land and James Bay. But not even Preble, in 1908, or McMillan and Stefansson more recently, seemed able to bring home the Blue Goose prize.

Some years before this, it had become known that these wildfowl were to be found in large numbers in the winter in the rich marsh-lands of the



THE MALE BLUE GOOSE STANDING: Photographed in Baffin Land.

There is a growing belief that the Blue Goose makes its migration in one gigantic hop, a real non-stop flight of about 1,600 miles. They arrive in the south practically en masse. On the return flight they follow practically the same route, flying north over Saskatchewan, and then hurtling north-east again and back across to their undisturbed breeding-grounds in Baffin Island. So great was the mystery of the bird's breeding-place that there has been a question among ornithologists whether or not there was a cross with the Snow Goose in the case of those bred in captivity, and whether the Blue Goose was a distinct species. Mr. Soper has now set the matter at rest. The Blue Goose is the Blue Goose, with blue blood and all, and not a cross. The United States Bureau of Biological Survey last January attempted to band the Blue Goose in co-operation with the American Wild Fowlers operating in a game sanctuary in Louisiana. The Canadian Government in the meantime had sought the solution of the mystery of the Blue Goose where it could only be solved, and Mr. Soper went in a year ago. This spring, when the ice began to go out and the bergs were crashing down Fox Channel, Mr. Soper started out from Cape Dorset on an expedition up the west coast of Baffin. His photographs show the disappearing ice and snow and the early arrival of the Blue Goose from the south. Indefatigably he traversed the breeding-grounds, and his achievement is being hailed among naturalists as a magnificent effort. Particularly fine are the photographs he brought back, and here are reproduced the first prints from his films."

lower Mississippi Valley, where the State of Louisiana maintains a wild-bird sanctuary for migrants, which are attracted by the special foods plants there in quantity. Many eminent naturalists and photographers journeyed down to see them, and pondered anew at the mysterious disappearance of these thousands of birds, once they had crossed the Canadian borders again each spring.

About four or five years ago, the always fascinating topic of the Chens cercueillens received a sharp and altogether unexpected stimulus with the announcement from the National Smithsonian Institution at Washington, D. C., that Keeper Robert Lambert of the National Park Zoo had actually succeeded in raising three young thoroughbred wild blue goslings.

One of the group was secured by the Curator of Ornithology, Dr. Charles Richmond, of the Smithsonian Institution, for a study skin. Two goslings, a male and female, remained, and never were two birds more closely watched and guarded than these. Visitors came from all over the world as soon as the news became known, and my own account of their rearing and its incidental history appeared in an issue of *Nature Magazine* of that year.

Prior to that time there had been

settings of supposedly thoroughbred wild goose eggs, but for some reason or other these had failed to hatch. Lambert explained to me that in his opinion the shell of this wildfowl, as he had found with the Green Goose, was particularly hard. He had lost a setting of the latter a year before, and had resolved to try dampening the eggs each day. This method, which was intended to replace the moisture that the parent geese might naturally sprinkle on their eggs on a return from a trip around the pond, proved highly successful. In fact this same keeper has since raised three or four other Blue Geese in the same manner.

Another very important point was the use of the Japanese hen. The Zoo was fortunate in having a number of these particular fowl, which had been brought from Japan the year previous by Senator Smoot and presented for just such purposes. This breed is very light on its feet, an important asset in rearing delicate wildfowl, and they have the additional advantage of proving excellent foster-mothers.

It might be added that one of the reasons why it had previously seemed impossible to rear wild Blue Geese is that these, as well as certain wildfowl, nest rarely in captivity. The

Continued on page 22



PICTURED FOR THE FIRST TIME: A Blue Goose's nest in the wilds of the North. This picture was obtained by Mr. J. Dewey Soper after over a year's search. Humanity at large, and ornithologists in particular, have been seeking the summer home for over two centuries.

IMPRESSIONS

By The Impressionist

At the Orange Festival at Winter Haven we invested thirty cents in a pint jug of Fruit of Youth orange syrup, which is being put out by a new citrus by-products concern at Lakeland. This morning we utilized this same orange syrup on our breakfast cakes; and it was truly delicious. There is no charge for this advertisement.

And thinking of the Orange Festival, we mentally lift our hat to Robert Sands, or whoever was responsible for the exhibit of the Florence Citrus Growers Association. We came away with the impression that this exhibit was the most artistic and effective of any that ever we have seen at any fair, in Florida or elsewhere.

Nor would we detract in any way from the extremely artistic exhibits of the DeSoto Growers, the Polk

County Sub-Exchange, nor that of the Haines City Citrus Growers Association. These were exceptional, and but for that remarkable exhibit by the Florence Villa growers would have stood out strongly in any company.

Wouldn't you say that whoever could cause Calvin Coolidge to laugh out-right, then slap his sides and laugh again, certainly was possessed of personality? Then acknowledge the personality of that Blue Goose which features the fair exhibits of the American Fruit Growers Inc. He (for this particular Blue Goose is of the male persuasion) came out of the exhibit and met the Coolidge party as it came down the aisle at Winter Haven. His antics took on an apparent aspect of extending a hearty and vociferous welcome; and from what followed very evidently touched the

Coolidge sense of humor strongly.

The Coolidge stay in Florida has aroused much interest; and Mr. and Mrs. Coolidge have had little time to themselves. However toward the end of January they slipped over to Orlando from Mount Dora and had dinner and spent the evening quietly with Mr. and Mrs. F. E. Godfrey. Yes, the same Fred Godfrey who heads the citrus shipping concern, the F. E. Godfrey Co., and who used to be president of the Fruitman's Club. The Coolidges and the Godfreys were schoolmates as children; and have always kept in touch with each other. Nobody there for the evening but the Coolidges and the immediate Godfrey family. Just sat around and read the paper and jawed each other, we reckon. Yet we heard later from Mount Dora that the Coolidges en-

Continued on page 17

Let Us Supply Your Printing Needs

For Grove, Packing House, Counting Room or Factory. Our equipment is complete, our service prompt and satisfactory and our prices reasonable.

Bartow Printing Co.,
A. G. Mann, Mgr.
Bartow, Florida

Owned and operated by The Citrus Industry

A better control of aphid
At a lower cost of spray

PENETROL

An Activator for
Nicotine Spraying Solutions

Saves up to three-fourths of the nicotine usually required.
Does away with the use of soap or other spreaders.
No heating of waters. No insoluble soap to clog the nozzle.
Is a standardized and uniform free-flowing liquid.
Mixes readily with hard water.
Can be combined with Lead Arsenate and Bordeaux Mixture.
Efficiency verified by Experiment Stations and the Crop Protection Institute.
The results of many experiments under a wide range of conditions for control of aphid attacking fruit, truck and ornamentals.

NICOTROL

For those who prefer the correct combination of Nicotine and Penetrol in one container.
PENETROL and NICOTROL may be obtained through your dealer.
Send for Leaflets and Further Information.
District Manager for Florida: R.D. Whitmarsh,
DeLand, Florida (Phone DeLand 2404).

Manufactured by

KAY LABORATORIES, Inc.
578 Madison Avenue
NEW YORK, N.Y.

The Citrus Industry

with which is merged The Citrus Leaf
Exclusive publication of the Citrus Growers and Shippers

Address all communications to the Main Office
1123 Florida Avenue
Tampa, Florida

Telephone 4819

S. L. FRISBIE, Editor and Manager

FRANK KAY ANDERSON Assistant Manager
C. D. KIME Horticultural Editor
A. G. MANN Production Manager

Published Monthly by
Associated Publications Corporation
Tampa, Florida

Subscription, \$1.00 per year in advance

Entered as second-class matter February 16, 1920, at the post office at Tampa, Florida under the act of March 3, 1879.

Branch office and production plant, Bartow, Florida.

NEW YORK OFFICE
118 East 28th Street
Edwin F. Ripley, Manager

J. C. CHASE HEADS EXCHANGE

An important, though not unexpected development of the past month in citrus circles, was the election of J. C. Chase as president of the Florida Citrus Exchange.

Mr. Chase, formerly head of Chase & Co., pioneer marketing agency which recently joined the Exchange, has for forty years been an outstanding figure in citrus circles, and following his election to the board of directors a few weeks ago, his elevation to the presidency was freely predicted.

In addition to his long connection with marketing organizations in both Florida and California, Mr. Chase is one of the largest individual producers of citrus in the state and knows both the production and marketing problems as few others know them.

In naming Mr. Chase to head the co-operative organization of growers, the directors displayed excellent judgment and discrimination. Mr. Chase is fitted by experience, executive ability and rare judgment for the position he has been chosen to fill, and his selection will do much toward establishing confidence on the part of growers and to enlist the support of the business interests of the state. The Exchange is to be congratulated upon bringing such an outstanding figure in the citrus world to the head of the organization.

A DESERVED HONOR

C. W. Lyons, president of the Lyons Fertilizer Co. of Tampa, was recently honored by Tampa Civitans by being named as the leading and outstanding citizen of that city for the year 1929.

This honor was bestowed upon Mr. Lyons because of his unselfish devotion to the interests of the city and his outstanding achievements in promoting the city's development and aiding in its material and civic progress.

The Citrus Industry believes that the choice of Mr. Lyons is well founded and that the honor bestowed upon him is richly deserved. Were the decision to rest with us, we would be inclined

to make the distinction permanent, rather than to confine it to a single year.

AWAITING DEVELOPMENTS

Florida citrus circles are anxiously awaiting the outcome of recent hearings at Orlando by the advisory board of the department of agriculture, which has been making its own investigations into the need of the proposed additional congressional appropriation of \$15,000,000 to continue the work of fly eradication, and also into the petition of Florida growers and shippers for modifications of the regulations governing the shipment of Florida fruits to Southern and Western markets.

At this writing, there has been no inkling of what recommendations may be expected at the hands of the advisory board, but there can be no doubt of the feeling on the part of Florida growers and shippers that the modifications asked for are not only reasonable, but that they are vitally important to the industry.

The appeals for modification of existing restrictions and for continued work of eradication through federal appropriation, were led by J. A. Griffin, president of the Florida Citrus Growers Clearing House Association.

GREAT EXPOSITIONS

Since the last issue of The Citrus Industry, Florida has witnessed two great expositions centering around the state's chief industry—citrus.

The first of these expositions, the Florida Orange Festival at Winter Haven, was an unqualified success, and even in this year of trial and tribulation for the citrus grower, was an outstanding demonstration of the importance of citrus among the material resources of the state.

The second great exposition, the South Florida Fair at Tampa, which has come to be known as one of the great expositions of the South, was hampered by unfavorable weather conditions, but in spite of that handicap maintained its reputation so worthily won in former years. While the attendance was cut by weather conditions, the displays, particularly in citrus, were the equal of any that have ever been placed on exhibition in the state. It was extremely unfortunate that rain marred one-half of the days devoted to the fair, thus robbing many thousands of Florida visitors of the opportunity of viewing the wonderful resources of the state at first hand.

Having nothing else in the world to worry about, the Florida citrus grower is now given the opportunity of worrying about a change of headquarters for the Florida Citrus Exchange.

Modification of shipping regulations is the one outstanding need of the Florida citrus grower and shipper at the present moment. The industry will never become stabilized while present regulations prevail.

If it is safe to ship Florida citrus into 20-below weather in New York, why is it unsafe to ship it into 40-below weather in Wisconsin?

BLUE GOOSE NEWS

Monthly News of American Fruit Growers Inc.



Edited by The Growers Service Department

VOLUME 4—NO. 3

ORLANDO, FLORIDA, FEBRUARY, 1930

PAGE 1

CALLS FOR EFFICIENCY IN PERISHABLE DISTRIBUTION

Crutchfield J.S.
J. S. Crutchfield, president of the American Fruit Growers, Inc., made a stirring speech at the convention of the Eastern Canada Fruit & Vegetable Jobbers' Ass'n at Toronto recently. "Is the Middleman a Friend and Ally of the Producer?" was the subject of his address as reported by The Produce News:

The marketing of farm products is a very live topic in the United States. "To be or not to be—that is the question," might be a more appropriate subject to discuss in a meeting of middlemen.

We have the great chain stores on the one side and on the other the Federal Farm Board, with an initial fund of \$500,000,000 and with a mandate to establish marketing organizations in all lines of agriculture, extending into by-products, and unlimited as to its entering into the wholesale jobbing and retail end of the business.

The passage of this extreme farm marketing legislation was due to the distinct feeling on the part of perhaps a majority of the farmers and also of Congress and even of the U. S. Supreme Court that a large part of the existing farm marketing machinery was not only inefficient but that it resulted in the farmers being exploited and robbed.

Quotes McReynolds

Justice McReynolds, speaking for the Supreme Court of the United States, in the case of the Burley Tobacco Growers Co-operative Marketing Ass'n, decided on Feb. 20, 1928, gave endorsement in his opinion to the following expressions:

"We take judicial knowledge of the history of the country and of current events and, from that source, we know that conditions at the time of the enactment of the Bingham Act were such that agricultural producer was at the mercy of speculators and others who fixed the price to the selling producer and the final consumer through combinations and other ar-

rangements, whether valid or invalid, and that by reason thereof the former obtained a grossly inadequate price for his products—so much so was that the case that the intermediate handlers between the producer and the final consumers injuriously operated upon both classes and fatigued and flourished at their expense.

"It was and is also a well-known fact that, without the agricultural producer, society could not exist and the oppression brought about in the manner indicated was driving him from his farm, thereby creating a condition fully justifying an exception in his case from any provision of the common law and likewise justifying legislative action in the exercise of its police power."

You will note in the daily press of the United States the bitter feeling on the part of many Congressmen and Senators from the agricultural States and their demand that the Farm Board exercise its power to the limit in freeing agriculture from the clutches of the horde of middlemen who have been feeding upon them. Some of this may be attributed to politicians who know better and who are thus catering to the people back home, but many of these rabid utterances come from real statesmen and righteous, intelligent jurists who think they are doing God's service as well as their own farm constituents when they pass this radical legislation to "cut out the middleman."

What is the significance of all this? Among other things, I believe it means:

That neither the legislators, the courts, the farmers nor the general public appreciate the high character of marketing service now rendered by commercial distributor and jobber;

That a feeling of impatience and dissatisfaction prevails that existing commercial factors have not gotten together in larger units to meet the increasing difficulties of economic distribution of farm products.

Need to Be Educated

As of old, the producer and con-
Continued on page 2

RESTRICTIONS PROVE HANDICAPS TO MARKETS

To January 31 Florida had shipped 9,697 carloads of oranges as compared with 15,051 to the same date last season. During the same period California orange shipments from all sections of that state amounted to 10,530 cars, according to Pacific Coast figures. This compared to 15,015 cars shipped from California last season to the same date.

Despite the reduction in orange shipments from these sources, amount roughly to ten thousand car-loads, market prices have not reflected the difference in available supplies. Though prices upon oranges generally have held at what in normal years might be called satisfactory levels, because yielding to growers a profit upon production, they have not at any time reached a basis such as would be justified by the relative scarcity of citrus and other fruits in the markets, and such as might have enabled growers in part to recoup for last season's experience.

To January 31 Florida grapefruit shipments amounted to 7,794 cars as compared to 9,432 cars last season. However, during this same period grapefruit shipments from Texas were more than two thousand cars ahead of last season's grapefruit supply from the same source. Thus there was no shortage in the available supply of grapefruit in the markets up to the time that Texas, due to the cold and shortening supplies ceased to be a factor of importance.

It is true that during January weather conditions in many markets were not conducive to the free movement of citrus fruits into consumption. However, such weather conditions are more or less to be expected during that time; and were not of such unusual nature last month as to account for failure of the markets to reach higher levels.

Explanation is found in the quarantine shipping restrictions, in the opinion of the most seasoned and ex-

Continued on page 3

Adv.

BLUE GOOSE NEWS

OFFICIAL publication of the American Fruit Growers Inc., Growers Service Department, published the first of each month in the interest of the citrus growers of the state of Florida.

EDITORIAL ROOMS
Sixth Floor, State Bank Bldg.
ORLANDO, FLORIDA



CALLS FOR EFFICIENCY IN PERISHABLE DISTRIBUTION

Continued from page 1

sumer both feel aggrieved at the middleman. They do not know what service he renders, and herein the great body of middlemen are much to blame for failing to educate the farmers and the general public and also for failure to develop methods that will automatically stamp out any abuses that still remain in the business. The trade must discipline its own members for its own protection. There is an honest and good living in this business for any factor that renders efficiently any part of the service of distribution.

Any middleman who can be eliminated should be eliminated and will be eliminated by the increasing pressure of economic law. To whatever extent the Government itself exceeds or interferes with the operation of economic law, to that extent will it damage the farmer and the public even more than it will hurt the legitimate and useful middleman.

The California Fruit Growers' Exchange, a purely growers' non-profit co-operative, and the United Fruit Co., a corporation operating for, and making, good profits, both dominating in their respective lines and eminently successful, are most appreciative and interested in encouraging, rather than eliminating, existing middlemen. Why? Because both know their business would be imperilled if

the facilities and interested personal service of the wholesale middleman were hampered or destroyed.

Make Known the Facts!

The mere fact of survival is evidence recognized by science of the usefulness and service of the surviving factors.

What should be the attitude of private factors under these trying conditions? "Whom the Gods would destroy they first make mad." Lawyers and statesmen learn this early in their experience. If the great body of private enterprises engaged in marketing farm products in whatever capacity were vindictive or revengeful, they could well afford to be patient and "give them rope and more rope." But this spirit is unworthy, and business men long since have learned that their patron is always right. Instead of allowing error, ignorance and prejudice to prevail, it is up to the commercial distributors to expend part of their dynamic energy and more of their friends in making known the facts through trade bodies and otherwise. This can be done! It is less difficult than heretofore because the attention and interest of the farmers, the Government and the public are all focused on this vital subject.

Welfare Is Important

An audience is assured to any man with a message. The successful farmer is no fool; he knows the danger of political remedies for economic problems. The large body of economists connected with our great colleges and universities is becoming very practical as it gains experience. Note the valuable service rendered the fruit and vegetable trade and the public by Professor Rasmussen of Cornell, the Milk Distributors by Dr. Clyde King of the University of Pennsylvania and many others. Note also the complete and splendid report submitted in 1927 by the Business Men's Commission on Agriculture, appointed jointly by the National Industrial Conference Board and the U. S. Chamber of Commerce.

The prosperity of the farmers of this country is of vital importance to everyone, especially those engaged in the marketing of agricultural products. The farmers and the public will receive more practical education in the facts of farm marketing during the next few years than they have during the past century. The situation of today will be greatly improved with the passing of time. Painful and expensive lessons will be

learned, not only by the farmers, but also by the Government and the general public.

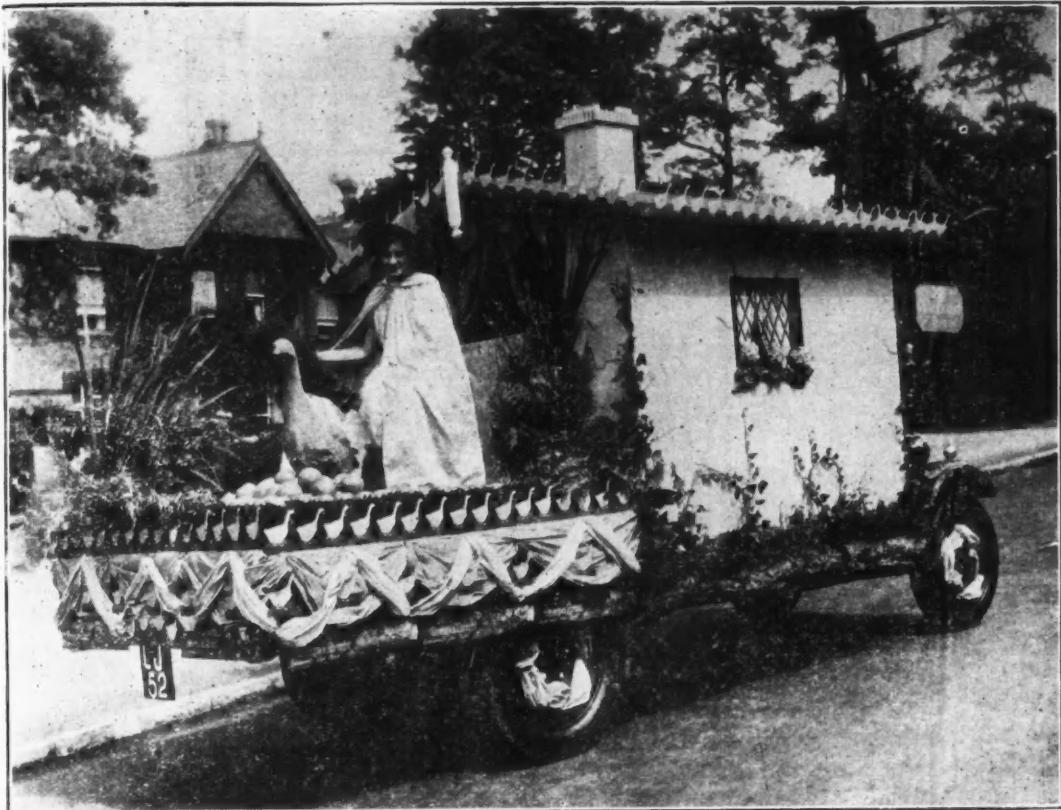
Farmer to Be Gainer

Recent occurrences in Wall Street remind us that "old natural law" is still on the job. The farmers of this country for 10 years following the war received the worst of it from the Government in the shape of drastic post-war deflation; increase in freight rates (by Government decree); drastic restrictions of immigration (a good thing in the long run), and by high tariffs, which adversely affect foreign markets for American farm products. Conversely, the consumers and the railroads have been getting the best of it during the past decade. "Old natural law," however, is still on the job and during the next decade it will be strange if the farmers do not get the best of it. We may hear much of consumer distress caused by rapid increase in the use of labor-saving machinery; of manufacturers' troubles due to increased competition from a stabilized Europe; and perhaps complaints from railroads about decreasing freight rates caused by an abundance of rail, water, air and motor transportation.

Any radically discriminatory legislation unduly favoring producers will be resented by the consumers and the Government fears consumer resentment and responds promptly when its voice is heard. The consumers have the majority of votes. The consumers' normal demand means a healthy market but when the consumers fall back in actual needs and buy accordingly the markets are immediately demoralized.

Rights of All Guarded

Any unreasonable phase of the new law will be temporary. The Farm Board is composed of good men who are anxious to do the right thing. The President of the United States is a sound and widely experienced economist, who has always been the strongest possible advocate of private enterprise and individual initiative and against Government in business. The President, while Secretary of Commerce, originated the clearing house plan and had it incorporated in the Farm Relief Bill. This permits co-operation between the co-operative associations and commercial distributors. After more study and experience, it is anticipated that this feature of the law and the rights of all legitimate private marketing factors will be accorded all consideration.



THE BLUE GOOSE IN OLD ENGLAND—The float shown above was the prize winner in a carnival last summer at Bournemouth, England, the famous waterside resort of John Bull's best citizens. The bewitching witch, naturally enough, is an English lassie; but the goose she chaperones is the same old Blue Goose which, despite great popularity in the British Isles, still retains American citizenship, and carries the message of American growers to the British consuming public.

possible under the law.

Gordon C. Corbaley, president of the American Institute of Food Distribution, New York, in a recent issue of the publication entitled "The Facts in Food Distribution," said:

"The Federal Farm Board program promises to alter materially the entire structure of food distribution. That process of altering will be successfully carried through with a minimum of interruption to present business, just to the extent that the Government men realize that these new creations will be of maximum immediate value only if they can be peacefully fitted into existing operations and the men whose life work is to conduct these latter operations realize that the Government program is on the way and extend friendly cooperation toward making the necessary adjustments."

RESTRICTIONS PROVE HANDICAPS TO MARKETS

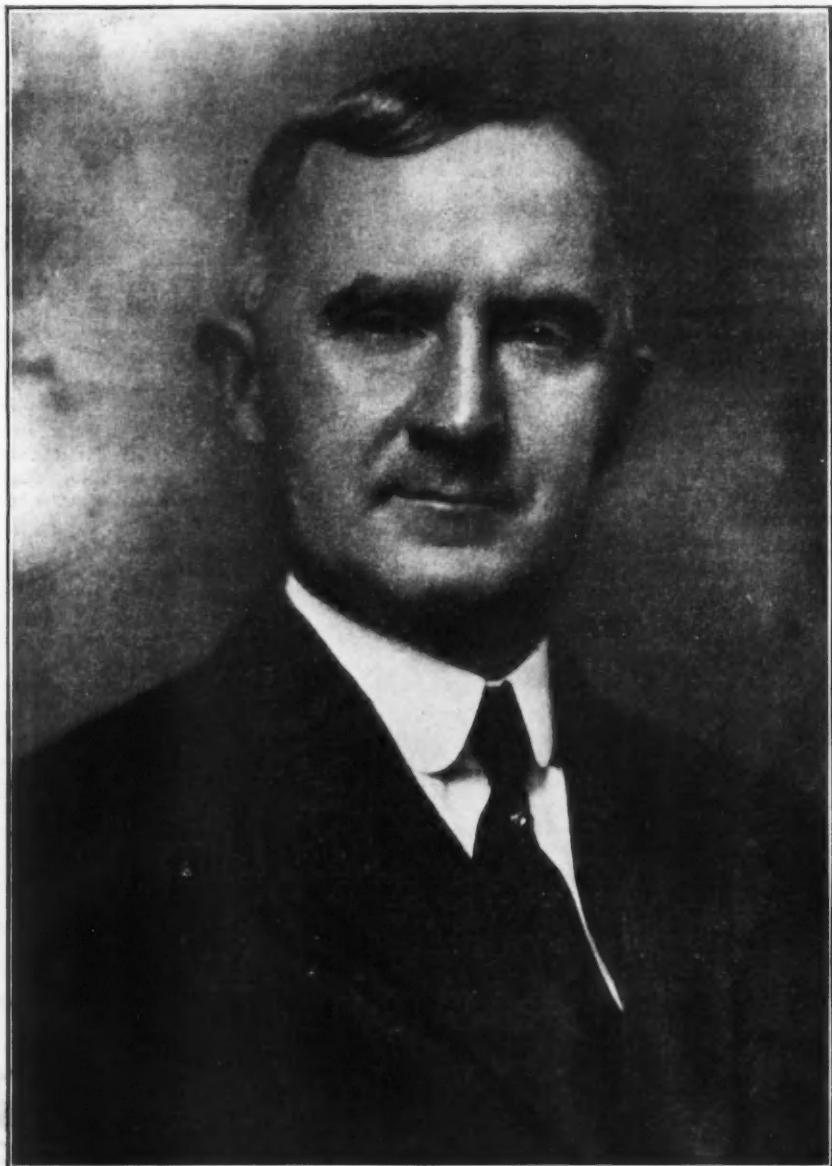
Continued from page 1

perienced citrus marketing authorities. Tabulated experience in Florida shows the effect of these restrictions is to force an undue proportion of the crop into the markets of the eleven states which are open. Failure of the consuming public to endorse the view advanced in some quarters to the effect that sterilized or processed citrus fruits are "really better eating than fruit in its natural state," accounts for the continued predominance of Florida shipments into the eleven open states.

For some time past, and continuing at this writing, Florida growers and shippers have presented the strongest possible pleas to the author-

ties for relief from this situation. It is just possible that by the time this appears in print some relief may have been granted. Again, it may not.

Granted adequate relief from these restrictions the outlook for the balance of the season is most excellent. Failing that the outlook apparently is for a continuation of conditions such as have held during the past few weeks, with markets ranging from fairly satisfactory to only fair. The various Florida factors have worked well together in the face of the conditions prevailing; but the best coordinated efforts have been able to accomplish only just so much. Relaxation of restrictions, however, should enable similar efforts in the immediate future to obtain unusually effective results. Moreover, it would make it possible to move the crop out within the time allotted.



AFG PERSONALITIES

Bentley Wilson

WILLIAM H. BAGGS, Vice President and General Manager of the national organization of the American Fruit Growers Inc. From his office at Pittsburgh he controls the widely flung AFG operations. From a high traffic position with one of the largest railroads he entered the produce field nearly twenty years ago as manager of the old firm of Crutchfield & Woolfolk. Following formation of the American Fruit Growers Inc. he was its first General Sales Manager, later being made General Manager and then elected Vice President. He is one of the best known figures in the produce field in the United States.

February, 1930

THE CITRUS INDUSTRY

Seventeen

Citrus bark disease

Disinfectant Pastes and Washes for Treating Bark Diseases of Citrus Trees

By Arthur S. Rhoads, Associate Plant Pathologist, Florida Experiment Station

Disinfectant pastes and washes have proved useful for applying to the exposed bark of the trunks and limbs of citrus trees that have been scraped for the treatment of psoriasis or gummosis, to the trunk and roots of trees attacked by foot-rot after the areas of diseased bark have been cut out, and to pruning wounds where there is likelihood of transmitting infectious diseases. These disinfectants may be applied with a brush or the liquid ones may be applied with a small hand sprayer. Directions are given for the preparation of the more common and useful of these disinfectants as follows.

Bordeaux Paste

Dissolve 1 pound of bluestone (copper sulphate) in 3 quarts of water in an agate, wooden, earthenware or glass (never iron) vessel. In another container, slake 2 pounds of fresh stone lime in 3 quarts of water. If this is not available, use 2% pounds of fresh hydrated lime instead. To prepare the paste, mix equal parts of the two (after stirring the milk of lime thoroughly) and stir well. Only enough of the paste should be mixed for the day's use, since it deteriorates slowly after mixing. The bluestone solution and milk of lime, however, will keep indefinitely in separate containers if bottled or covered tightly to prevent evaporation.

Lime and Sulphur Pastes and Washes

These pastes and washes may be made in a number of different ways as follows, using either lime-sulphur or mixtures of lime and sulphur:

1. Mix 1 gallon of commercial liquid lime-sulphur with 2 gallons of lime paste made by slaking 3 pounds of stone lime to each gallon of water. If stone lime is not obtainable, use 4 pounds of hydrated lime.

2. Mix equal quantities of hydrated lime and either flowers of sulphur or dusting sulphur and sift into water, beating thoroughly with a wire whip and using only enough water to make a thin paste.

3. Lime-sulphur washes may be prepared either by diluting $\frac{1}{2}$ gallon

of commercial liquid lime-sulphur with 2 gallons of water or by dissolving $\frac{1}{2}$ pound of dry lime-sulphur in 1 gallon of water.

Carbolineums

Certain kinds of high boiling coal-tar products known as carbolineums or creosotes, have been used extensively by growers in the painting of pruning cuts and miscellaneous wounds, and in painting the bark in attempts to control psoriasis and gummosis. There are many kinds of light tar products sold under the general head of carbolineum. These vary greatly in composition and some are very injurious to citrus bark. Consequently, growers are advised to be cautious in the use of carbolineums and related preparations and to test out doubtful products on the leaves and twigs first, avoiding their use if considerable injury results.

A very caustic carbolineum often can be applied in a limited way to pruning cuts or other wounds without particular injury but, if the trunk be painted with it all the way around, and especially if the bark has been scraped over any considerable area, the bark may be killed and the tree thereby girdled. Whenever carbolineum is used on the bark it should be brushed out as much as possible. Thick applications commonly warm up on hot days, with the result that the carbolineums may run down and collect at the base of the tree. Large numbers of fine trees are commonly killed each year by those who paint the trunks promiscuously with untested products.

One light coal-tar or creosote oil has been tested out rather thoroughly on citrus trees during the past several years and appears to be reliable. It has proved very satisfactory as an antiseptic for wounds and for painting the unscraped trunks of trees. It may be used at full strength on pruning wounds, but for use on the trunks of trees it should be diluted with an equal amount of water in which fish-oil or laundry soap has been dissolved at the rate of 1 pound to a gallon. Another preparation which is also a light creosote oil that can be diluted instantly by stirring it into water, has proven highly satisfactory as a tree wash.

"Please Say You Saw It In The Citrus Industry"

While the carbolineums are excellent disinfectants for pruning and other wounds, they should not be relied upon as permanent wound dressings, since they allow the treated wood surface to check so that decay-producing fungi may gain entrance. Their use should rather be limited to that of a disinfecting treatment preliminary to the application of a more durable waterproof wound dressing. For the latter purpose, a home made alcoholic solution of rosin or certain commercial roofing preparations are probably unexcelled.

IMPRESSIONS

Continued from page 11

joyed this evening of comparative privacy tremendously.

However, the Coolidge stay in Florida doesn't seem to have improved John D. Rockefeller's habits a bit. Over at Ormond the Standard Oil wastrel still continues his distribution of dimes.

Dropping in to his Orlando office to congratulate Joshua C. Chase upon his election as president of the Florida Citrus Exchange, on the day after that event in Tampa, we found that he was without official information on the subject. Telephones and telegraph failing, it is our impression some director might have taken time out to have sent J. C. a postcard.

Still we doubt if Joshua C. Chase was very greatly surprised at what he read in the papers that morning. His forthcoming election to the post had for quite a time been one of the biggest open secrets of the industry in Florida. But for the fact that no



Beautify Your Home Grounds

Visit us at Oneco, or write for free advisory service. Over 45 years experience is yours for the asking. Free catalog on request.

Reasoner Brothers'
ROYAL PALM NURSERIES
Oneco, Florida

one would confirm it, the event might well have been chronicled weeks in advance. The leakage from Washington of an alleged ultimatum from the Federal Farm Board to the Florida Citrus Exchange concerning phases of the management of the latter, and the coupling of Mr. Chase's name therewith, had been given rather widespread verbal distribution in citrus growing circles.

Well, Joshua C. Chase has been a success all his life; and with his wonderful background of experience, he'll undoubtedly make a success of his new job. When the Big Freeze of '95 came along and left the citrus industry of Florida staggering, the then firm of Chase & Co. was very hard hit, as was everybody and everything else in Florida. Joshua C. Chase took his black satchel and his linen duster and, leaving S. O. Chase and Mr. Harney to look after what was left of Chase & Co. in Florida boarded the Cannon Ball and left for parts where the pickings were better. Almost immediately he was active in the fruit business in California; and very shortly thereafter he was functioning as general manager of the Earl Fruit Company there, which in those days was the big concern in the California field. His earnings there enabled him to aid in putting Chase & Co. on its feet again and allowed him to return to his chosen Florida field a successful, rather than a defeated man.

And D. Collins Gillett back upon the board of directors of the Exchange. Now as representative of the Di Giorgio interests in Florida. You can't keep a squirrel on the ground.

Billy Fullenwider up from Tampa; and looking well. Following the merging of the Standard Growers Exchange into the International Fruit Corporation, he discontinued service as purchasing agent and went to Tampa in charge of the banana business there. Billy's banana stand is on one of the upper floors of the Stovall Professional Bldg. Drop in and buy a dozen when you are passing.

Speaking of dropping in, you old-timers will profit if when passing through Winter Haven you drop around to the late Dr. Ross' house and pay a little visit to Mrs. J. H. Ross. We found time for it the other day; and got a whole lot of joy out of it. She is always delighted to see again Dr. Ross' former associates and friends.

Talking of big people, there is Wil-

liam H. Baggs, general manager of the national organization of the American Fruit Growers Inc., whom we just bumped into on the street in Orlando. Big as he is in business he is just as big physically, one of the biggest all 'round, not to be fat at the same time, that we know of. Once at a trade convention a Jewish gentleman confided that William H. Baggs held the reputation of being "the squarest guy in the fruit and vegetable business." If so, his mind and character only match his physique. He is a whaling big block of a guy.

In an ordinary gathering of average men R. B. Woolfolk looms up for his size. J. S. Crutchfield, however, goes him one better in both height and heft. Complete the trio with William H. Baggs, and let them stand together, and only then does realization come as to what out-size comrades these, the Three Musketeers of the American Fruit Growers Inc. really are.

In writing advertisers please mention The Citrus Industry.

SOUTH'S CHAMPION

FARMERS ON TOUR

Champion farmers of the Southern states to the number of thirty-five, have just concluded a tour of Florida as guests of the Chilean Nitrate of Soda Educational Bureau.

Arriving in Tampa by boat from New Orleans on the morning of February 10, the thirty-five farmer guests were given a complimentary breakfast at the Tampa Bay Hotel, at which a number of Floridians also were guests of the Bureau, on invitation of J. F. Bazemore in charge of the Florida division of the Bureau at Orlando.

After leaving Tampa the guests were taken by auto to the trucking centers of South Florida and then into the citrus producing sections of the hill and lake region. A visit was also made to the citrus experiment station at Lake Alfred.

States represented in the tour by the champion farmers in different lines, are: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia.

The party also included county and district agents from the states named.

Chaco FERTILIZER



Good fertilizer is the cheapest. You require less and you make a better crop. Use Chaco.

CHASE & COMPANY

Sanford, Florida

February, 1930

THE CITRUS INDUSTRY

U. S. Citrus Goes All Over The World

New York, Jan. 24.—American citrus fruits went to more strange lands last season than even marines can boast of in their famous song. Grapefruit was shipped to icy Norway and Labrador and to tropic Brazil and Egypt. The Ceylonese, the Javanese and the Japanese were all included in our list of customers. Even the Bolivians and Nigerians bought our citrus fruits. Altogether, approximately 60 different countries imported citrus fruits from the United States during the fiscal year ended June 30, 1929.

The largest purchasers were Canada and the United Kingdom. The Philippines, New Zealand and the Netherlands took large quantities of oranges, while France and Germany loomed as increasingly important customers for grapefruit. Japan and New Zealand took more lemons than any of the other countries outside of Canada and the United Kingdom.

The most important customs district, from the standpoint of total exports, was Michigan. Detroit apparently is the gateway through which most of our citrus fruit passes to Canada. More than 2,000,000 boxes of oranges, 60,000 boxes of grapefruit and 94,000 boxes of lemons passed through the Michigan customs district last year. Second in importance for oranges was Los Angeles, which exported 820,000 boxes. Large quantities moved through all of the northwestern border States into the western provinces of Canada.

Florida Biggest Exporter

Florida was the most important exporting point for grapefruit, and one-fourth the total exports were through the Florida customs district, the exports amounting to 235,000 boxes. New York was second in importance as a grapefruit exporting district, with a total of 216,000 boxes.

More lemons went through the Michigan customs district than any other, although San Francisco was a good second. Only 4,800 boxes of lemons were exported via New York.

The total exports of citrus fruits during the past fiscal year were heavier than ever before, with an especially high record for grapefruit. Exports of oranges totaled 4,223,334 boxes, or between 11,000 and 12,000 carloads. Grapefruit exports were 940,473 boxes, and lemon exports amounted to 301,689 boxes.

Orange exports reached their peak in May, grapefruit exports in March,

and lemon exports in December, as the following table indicates:

Citrus Fruit Exports During Fiscal Year Ended June 30, 1929

Month	Oranges	Gr'p'f't Lemons
July	174,970	42,447
August	186,320	36,723
Sept.	145,452	10,095
Oct.	108,126	27,512
Nov.	209,244	87,849
Dec.	344,935	80,002
Jan.	302,606	84,982
Feb.	323,245	117,972
Mar.	536,227	21,622

	Nineteen		
April	480,287	106,301	24,115
May	754,844	119,352	21,329
June	657,079	10,452	28,171
Totals	4,223,335	940,473	301,689

Spuds Johnson says: "I use to try this, try that, and try 't'other; now I try what my State Experiment Station says try—and I save time and money."

Winter grazing for cows is a three way blessing, it has feed value, stimulates appetite, and maintains physical condition.

In writing advertisers please mention The Citrus Industry.



Year
after Year
CONSISTENTLY GOOD
RESULTS

PROFIT by the experience of many of Florida's most successful growers who have been using NACO Brand Fertilizers over a period of years.

Not just one good crop, but year after year they have had the kind of results that they rightfully expect from the proper formulas made of better materials, and regardless of whether they use all minerals in the Spring Application or mixed fertilizers, NACO points the way to better citrus profits in increased yields and improved quality.

The orderly marketing of this year's citrus crop shows what can be done to remove the penalty of increased production in the citrus industry and emphasizes the premium paid for quality.

Plan now to use NACO Brand Fertilizers this year.

NITRATE AGENCIES
1401-1405 JACKSONVILLE
LYNCH BUILDING FLORIDA
COMPANY

Foot-Rot of Citrus Trees and Its Treatment

By Arthur S. Rhoads, Associate Plant Pathologist, Florida Experiment Station

Foot-rot is one of the gumming type of bark diseases which is of wide-spread occurrence throughout the citrus sections of Florida. It is confined chiefly to the older sweet seedling orange groves and to trees budded on this and other especially susceptible rootstocks. Even where resistant stocks are used, however, the disease may occur above the bud union on low budded citrus trees. Grapefruit stock is often affected but seldom seriously damaged. The rough lemon stock is not particularly subject to the disease. Both the sour and bitter-sweet orange stocks are highly resistant.

Appearance

Foot-rot attacks the tree at the root-crown or on the upper portion of the highest main roots. It rarely extends more than a foot or so above the ground and often works chiefly on the main roots where they come out from the root-crown just below the surface. The presence of this disease is first indicated by a slight exudation from diseased spots in the bark at the base of the trunk. These places are characterized by a brownish discoloration of the outer bark and a decayed condition of the inner bark, which has an ill-smelling, fermented odor. The bark is killed in irregular patches from a few to several inches in height, the visible portion of which extends up the trunk above the surface of the soil and the remaining portion downward along the main roots. In the advanced stages of the disease the areas of affected bark become dry and sunken. If the progress of the disease is checked for a time, the areas begin to heal at the margins and the dry, dead patches of bark crack away from the living bark, leaving a narrow fissure outlining the diseased area. The disease commonly spreads until it more or less completely girdles the tree at the root-crown or kills the bark on the majority of the main roots.

Trees attacked by foot-rot may continue to bear fruit for a time but the foliage soon becomes yellow and the twigs and branches die and one side of the top or, often, the whole top declines gradually. Sometimes, when virtually girdled, the tree may put on a heavy crop of small fruit. Trees attacked by foot-rot are often

invaded by various wood-rotting fungi, which may cause them to break off prematurely at or just below the ground line.

Cause

Foot-rot is caused by the attack of *Phytophthora parasitica* (*terrestris*), a soil-inhabiting fungus of wide distribution through tropical and subtropical regions. The conditions under which citrus trees are growing have a very important influence on the prevalence of foot-rot. The fungus causing foot-rot is most active and develops most rapidly in low, damp or wet soils or in moist, shady situations. It often thrives in closely planted groves where the ground is shaded and in groves where dirt, wood, weeds, or rubbish is piled around the bases of the trees or where weeds are allowed to make a rank growth about the bases of the trees. Any practice which injures the roots and bases of the trees or favors the retention of damp or wet soil conditions about the root-crown is conducive to the infection of susceptible rootstocks by the foot-rot organism and the development of the disease.

Control

Measures for the control of foot-rot may be divided into two kinds, namely preventive and curative. Among the former may be mentioned the use of resistant stocks, adequate drainage of the land and the avoidance of too close planting, too low budding, too deep setting, scarring the roots and bases of the trunks in cultivation, a rank growth of weeds about the bases of the trees, and the piling of dirt, wood, weeds, or rubbish about the bases of the trees for any great length of time.

In treating trees attacked by foot-rot it is first necessary to clear away the top soil in a circle three or four feet in diameter about the root-crown

in order to fully determine the extent of the trouble underground. This should be done very carefully so as not to scar the roots. Where a large number of trees are to be treated, this tedious job can be done to best advantage by washing the soil away with water, using one of the leads of hose on a power spraying outfit after disconnecting the spray nozzle or else replacing the regular disk by one with a large hole. If the disease is found to have developed so exten-

C. D. Kime

Consulting
Horticulturist

Grove Advisory Service,
Soil Investigations,
Research.

P. O. Box 222
Phone 3489
ORLANDO

ORANGE COUNTY, Florida



Orange and Grapefruit Capital of Florida

ORLANDO, county seat of Orange County, is the largest marketing point for oranges and grapefruit in Florida. Last year this county alone shipped 8,354 carloads of oranges, grapefruit and tangerines yielding to growers and shippers more than \$7,000,000. Numerous tracts of orange and grapefruit land available here at reasonable prices. Also land adapted to truck farming, poultry raising, etc. Delightful year-round climate. Rolling hills, hundreds of lakes. For booklet, address Orange County Chamber of Commerce, 617 State Bank Bldg., Orlando, Florida.

HOTEL HILLSBORO

Tampa, Fla.

TOP O' THE TOWN

European Plan, Fireproof 300 Rooms With Baths

THE CENTER OF TAMPA

sively as practically to girdle the tree it is useless to attempt to treat it by surgical methods. When the disease has not advanced too far, it should be treated by carefully cutting out all areas of diseased bark, using a sharp knife, chisel or gouge as may be necessary. All dead roots should be cut off flush with the root-crown and all diseased bark and roots cut out should be collected and burned to prevent further spread of the causal organism. All wounds and exposed wood surfaces should be treated with some good safe disinfectant, such as Bordeaux paste, lime-sulphur paste or lime and sulphur paste. The disinfectant may be applied with a brush or, if made sufficiently thin, with a small spraying outfit. All exposed wood surfaces should be painted later with a good waterproof wound dressing to prevent the entrance of wood-boring insects and decay-producing fungi. It is advisable to leave the root-crowns of treated trees exposed for several weeks, if there is no danger from freezing to favor the drying out of the bark and the aeration of the soil.

Trees that have not become too completely girdled by foot-rot often can be saved by merely planting three or four sour orange or other resistant trees about the base of each attacked tree andarching the tops into the trunk above the affected area. Even trees that have become greatly weakened by foot-rot may be saved and rejuvenated by banking with soil to a height of at least a foot above the partially girdled portion, after first treating and disinfecting the foot-rot lesions. A framework about four feet square about the base of the tree will retain the soil in place. A well-developed new root system may be induced to develop within from 3-5 years from the callus formed at the lower limit of the living bark just above the nearly girdled base.

The grove should be inspected semi-annually in order to detect cases of foot-rot and other bark diseases so that the trees may be treated before the diseases progress to such an extent that they treaten the lives of the trees. An inspection of the base of the tree usually will reveal the presence of foot-rot long before it becomes evident by the way the top of the tree has died back.

GROVE HEATING IS JOB THAT REQUIRES CORRECT EQUIPMENT

Continued from page 8

utilized in adjusting the heaters. In reading the thermometers an electric

light should be used instead of matches to prevent raising the temperature. The reading should be made as quickly as possible to prevent changes in temperature due to heat from hands or breath of workman.

Oil heaters are more quickly lighted and brought to a rapid rate of burning than either coke or wood, he said. This fact should be remembered if either of the latter types are used. Where severe cold is expected it is best to light most of the heaters immediately and allow them to burn slowly rather than attempting to hold the temperature with a few heaters burning at a high rate.

For the benefit of beginners, Dr.

Camp gave a few warnings to be followed in operating heaters. The lighting torch commonly used has a brass glaze in the spout to prevent back firing and in no case should this be removed, as it might result in the explosion of the torch. Most oil heaters are difficult to light the first time and frequently the firing of the low stack type of heater for the first time may be simplified by placing a small piece of light wood in the stack when it is first filled.

Above all, grove owners should do a lot of figuring and get their help organized. Heaters call for thermometers, fuel, good judgment and eternal vigilance.

● RIPEN ● COLOR ● BLANCH WITH ETHYLENE



Increases profits

Reduces losses

Saves time

INEXPENSIVE—EASY TO USE

All these advantages

1. Greatly reduces time required for ripening.
2. Prevents waste from rots and fungous growths.
3. Improves flavor.
4. Produces better color by more complete action on the green pigments.
5. Ripening and coloring go on simultaneously.
6. Makes possible the marketing of heretofore unknown tropical fruits.
7. Ripens and colors fruits and vegetables that mature late in the season.
8. Is inexpensive and easily used. Simple apparatus and little experience required.
9. Can be applied equally well to a few crates or a whole carload of fruit or vegetables.
10. Is neither injurious nor dangerous. Widely used. A proved success.

For information write to

CARBIDE AND CARBON CHEMICALS CORPORATION

30 East 42nd St., New York City

P. O. Box 596, Los Angeles, Calif.

114 Sansome Street, San Francisco, Calif.

Warehouses in Los Angeles, Tampa, Jacksonville, and other principal cities

Unit of Union Carbide



and Carbon Corporation

A TWO-CENTURY BLUE GOOSE CHASE

Continued from page 10

particular parents of the goslings in question had been in the National Zoo Park for seven years prior to hatching these particular eggs, and according to the late Ned Hollister, the then director of the Zoo, only the secluded arrangement of the very large pond and the ample space allotted to the wildfowl in a stream kept as nearly as possible like a forest pond made the success a tangible one.

The importance of the rearing of these Blue goslings may be better appreciated by the fact that the Jardin des Plantes of Paris subsequently presented a gold medal to the Smithsonian Institution for this feat. Scores of people wrote in to the authorities regarding Blue Geese they had raised or known, but the particular point was that the life-cycle of these geese from known thoroughbred parent Blue Geese on both sides, was a record. Moreover it entirely proved to the satisfaction of naturalists that there actually existed a definite species known as the Blue Goose, with photographs to support the claim.

Shortly thereafter three different expeditions left for Canada with the declared intention of "studying wild life." Strangely enough, they seemed to have one destination in common, since they were later reported as heading for the old Blue Goose

THE CITRUS INDUSTRY

stampings grounds in and around the Missinabi River, James Bay, and Baffin Bay.

At about that same time the Dominion of Canada decided to send in a trained ornithologist to solve this mystery, with a modern message to Garcia of "Get Your Goose," and according to latest reports there must be something to this method after all.

But as Robert W. Service remarked some time ago, "It isn't the gold that you're wanting so much as just finding the gold," and with the discovery of the summer home of this highly elusive and sophisticated bird, a certain indefinable charm will always be lost to the rest of the naturalists in looking over a map of Labrador. No longer will their wistful glances be directed to James Bay or Ungava. No longer will there be a feathered goal on the pages of that invisible sheet, "Lost to Science: the nest and egg of the Wild Blue Goose."

DEATH CLAIMS

PROMINENT GROWER

Ringdahl Sister

Gustav Ringdahl, about 63 resident of White City for nearly 30 years, died suddenly at his home there early Sunday morning, January 26.

Death came apparently during sleep between 3:30 and 4 o'clock and was discovered by Dr. F. A. Gowdy of Miami, who with Dr. Andes, also

of that city, was spending the night at the Ringdahl home. The deceased was being treated for a slight cold which he had contracted, and was last seen alive by Mrs. Ringdahl about 3:30 o'clock. He had been in poor health for a long time, but his condition was not considered critical.

Mr. Ringdahl was a native of Sweden, having been born in the vicinity of Stockholm. He came to this country when about 20 years of age and located at Wilmington, N. C., where he was in business for some years and where he met and married his first wife, who preceded him to the grave about two years ago. Later, they moved to Atlanta, Ga., and still later to Palm Beach, where Mr. Ringdahl was assistant head gardener in the planting and development of the beautiful Royal Poinciana and Breakers hotel gardens. They then moved to Jensen and shortly afterwards to White City. Here they planted a citrus grove, which is now one of the finest in that section, and took a very active part in the development of the community. Being of a amiable disposition, Mr. Ringdahl made numerous friends who will mourn his departure.

He served for some time as a member of the old Fort Pierce inlet commission and for a number of years

Early Buyers Save

The equipment you are going to need for next season should be ordered now. We are offering a substantial discount on early orders for complete outfits and unit installations of washer, dryer, polisher and sizer. Individual machines and repairs do not carry a discount.

By anticipating your wants your outfit will cost you considerably less and will be better planned because more time is available to study your needs.

Our all-steel packing house equipment is giving wonderful satisfactory service. Repairs and upkeep are less, power bills are lower, more accurate work is done and longer life is insured.

Come to Headquarters for Packing House Machinery

Florida Citrus Machinery Co.

Division Food Machinery Corporation
B. C. Skinner, President

Dunedin, Florida

THE PARKER-SKINNER SIZER
is just one of our complete line of all-steel machines. By changing from wood to steel construction we provide a solid, rigid foundation upon which to anchor all moving parts making possible many operating economies.



February, 1930

was an officer of the White City Improvement club. He was also an active Mason, Knight Templar and Shriner.

He is survived by a wife and step-daughter by a second marriage.

**NEW PREPARATIONS
GIVE EFFECTIVE RESULTS**

Nicotine sulphate has long been used as a standard aphicide on Florida farms, but a serious objection has been its price. In an effort to reduce the expense of using this aphicide, A. N. Tissot, assistant entomologist of the Florida Agricultural Experiment Station at Gainesville, and W. L. Thompson, entomologist of the Citrus Experiment Station at Lake Alfred, have carried out a series of experiments with different preparations. The results are encouraging, for they have found that there are two materials, both new, which will materially reduce aphicide costs.

To give a good kill with nicotine sulphate it has long been recognized that a spreader was essential. The spreader most generally used has been soap. Whale-oil soap has been the most popular, though laundry soaps are frequently used. With these soaps a concentration of one part of nicotine sulphate to about 750 parts of water is usually required to give a good kill, the amount of soap used depending upon the hardness of the water.

One of the products tested by the state experts is Penetrol, a patented activator for nicotine sulphate manufactured by the Kay Laboratories, Inc., of New York, with Florida offices at DeLand. This substance in some way helps the nicotine to penetrate the insect better, or perhaps it penetrates the insect readily and carries the nicotine with it.

"We have gotten excellent kills with dilutions as low as one part of nicotine to 4,000 parts of a solution carrying one-half of one per cent of Penetrol," says Prof. J. R. Watson, state entomologist, in summarizing the aphicide experiments. "It is a promising substance and seems to be perfectly safe as far as any injurious effects on plants are concerned."

Penetrol is a free-flowing liquid and when used with nicotine sulphate it eliminates the need for soaps or other spreaders. It mixes readily with hard water and can be combined with lead arsenate. The Kay Laboratories, Inc., manufacture a product known as Nicotrol, which is a combination of Penetrol and nicotine sulphate, for those growers who prefer a preparation already for use.

Continued on page 26

THE CITRUS INDUSTRY

LIBRARY
JACKSONVILLE, FLA.

There Is A Woman In The Case. . . .

She is the average woman standing before a display of fruit in some grocery or fruit store. She is going to buy oranges or perhaps some other fruit. It is this average woman who determines the income of Florida growers.

Before you place an order for fertilizer, you should think of her. If the Florida grower sends to the market fruit which appeals to this woman, she will buy it and pay a good price for it; if he does not, there are other oranges and other fruits.

ORANGE BELT BRANDS together with the advice and recommendations of one of our trained field men will assist you in producing QUALITY fruit — fruit that will appeal to this woman — the great American housewife.

Consult us before your next application.

There IS a difference in Fertilizer.

LYONS FERTILIZER CO.
Tampa  **Florida**

OFFICE 305 Citrus Exch. Bldg. PLANT 35th St. and 4th Ave.

"QUALITY FERTILIZER FOR QUALITY FRUIT"

SOIL ACIDITY AND CITRUS GROVE FERTILIZATION

Continued from page 5

grower to determine the reaction where there is the largest mass of feeding roots for the plant food obtained from this level largely controls the growth of the tree. If the soil is found to be alkaline mixed fertilizers may be perfectly satisfactory, as they are almost invariably acid-forming. If the soils are too acid, the usual type of mixed fertilizer may only increase the trouble, especially if it is the sole source of plant food for the tree. The cumulative effect of most mixed fertilizers is such that on acid or neutral soils some form of corrective is sooner or later necessary. This may take the form of nitrate of soda or calcium. It would be ideal if we could put enough of the nitrate in the mixed fertilizer to keep it neutral in its effect. But this is at present impossible, since when more than one-fourth of the nitrogen is in this form the fertilizer will cake and be difficult to handle. Three pounds of nitrate of soda will be necessary to neutralize one pound of sulphate of ammonia. Due to this high acid reaction of sulphate of ammonia, it should be partially replaced by other forms of nitrogen in mixtures. Probably the cheapening of urea will make it possible to remedy the difficulty, as urea is much less toxic in its effect. One pound of it is neutralized by one pound of nitrate. A mixture of equal parts of urea and calcium of soda nitrate makes a top dressing for citrus trees which is nearly ideal as it does not affect the reaction of the soil and can be used in much larger quantities without producing the toxic effect of the same amount of nitrogen when used in the form of sulphate of ammonia.

In conclusion, it is probably not amiss to discuss the methods of estimating the soil reaction. There are two methods, the potentiometer and the colorimetric. For field use the potentiometer is unsatisfactory, and most colorimetric methods are not sufficiently exact. The Lamotte-Morgan soil tester with a triple block is the most satisfactory one so far devised. When taking the sample, in order to get a general idea of the situation, it should be taken where there is the greatest amount of fine feeding roots, usually at a depth of four to six inches. If the fertilizers that have been used in the past have markedly differed from time to time, the acidity will be different at different levels of the soil profile.

In this short talk there is no at-

THE CITRUS INDUSTRY

tempt made to discuss the subject fully, but the main purpose is to call attention to the need for more careful examination of the subject, so that many of the troubles which afflict the grower may be avoided.

GARDENS LOOKING FINE

Kissimmee, Fla.—Gardens in Osceola County are looking fine now, reports Miss Albina Smith, home demonstration agent.

February, 1930

FARMERS WANT INFORMATION

Jacksonville, Fla.—Interest in the dairy and poultry industry in Duval County is being constantly manifested by demands for information, stated W. L. Watson, county agent.

A good fall growth will protect the pasture during the winter.

Buy next season's breeding cockerels now to get first choice.

Put it up to BRODGEX and Cold Stoarge

The big opportunity of this season lies in cold storage. If you can hold your fruit for several months and keep it sound, plump and fresh looking you can come pretty near asking your own price for it.

It is not unusual for Brogdex fruit to keep for 60 days in ordinary room temperatures without decay or shrinkage, but in cold storage it has a double advantage—the control that storage gives and the control that Brogdex gives. This double control enables Brogdex fruit to be kept for long periods of time and still sell without discount.

Packers who are worried about what is going to happen to prices when shipments are stepped up to move the balance of our crop, should put it up to Brogdex and cold storage. The combination will be hard to beat.

While the other fellow will be forced in a few weeks to take his fruit out of storage and sell regardless, your Brogdex fruit will show your original high pack with center straps tight, apparently as sound and fresh as it was the day it was packed.

Here are a few briefs from Brogdex users—shows the way Brogdex makes good its promises.

"No decay in 4 years of Brogdex."—Milne-O'Berry. "More and more pleased."—Umatilla CGA. "Completely sold on Brogdex."—Chester C. Fogate. "Tremendous factor in eliminating decay."—DeLand Packing Assn. "Save around \$70.00 a car icing charges and get 25c to 75c a box more for our fruit."—Dilpako Packing & Canning Co. "Would not export my fruit if I did not have Brogdex."—L. B. Skinner. "Brogdex will be of tremendous value to the Florida shipper compelled to use storage for long periods of time. It helps fruit to maintain its fresh appearance and prevents to a great extent the usual shrinkage and discoloration when pulled from storage."—E. C. Fitz & Co., Boston. "We can hold over stock for some time without fear of finding waste when sold."—Joseph Infantine, Buffalo. "We compliment you on the wonderful achievements you have made with Brogdex."—Jerome A. Larocco & Co., Chicago. "We would certainly recommend its use."—J. & G. Lippmann New York. "Should be of great advantage to retailers."—Consolidated Fruit Auction Co., Cleveland. "Trade looks favorably upon Brogdex."—Sweeney, Lynes & Co., Boston. "We are of the opinion that it will not be long before all fruit will be Brogdexed before shipping."—Guy W. Glass Brokerage Co., Memphis. "We give Brogdex credit for a goodly share of our orange business."—Franklin F. Schafer, Buffalo.

Better team up with Brogdex and get the most out of a situation that will not likely occur again in many years.

Florida Brogdex Distributors, Inc.

B. C. Skinner, Pres.

Dunedin, Florida

CITRUS FRUIT OUTLOOK

According to the department of agriculture, the following is the outlook for the citrus crop of the coming crop year:

The 1930 outlook indicates, as did this of the four previous years, a considerable increase in the bearing acreage of grapefruit and oranges. Many trees now in bearing have not reached the age of maximum yield, and a large increase in production may be expected in years when favorable growing weather prevails. Assuming an average of about 70 trees per acre, total orange acreage in Florida is estimated at 190,000 acres, of which 15 percent is non-bearing. Texas, with an acreage of 18,900 acres, has only about 25 percent in bearing. Only 3 percent of the 100,500 acres of California Navels is classified as non-bearing. Of the total of 112,200 acres in California Valencias, 20,900 acres or 19 percent, are non-bearing.

Florida, with a total grapefruit acreage estimated at 80,000 acres, has approximately 95 percent of bear age. Texas, with approximately 70 percent of the acreage of Florida, is estimated to have only about 20 percent of bearing age. The California bearing acreage is reported as 9,000 with a forecast of 11,800 bearing acres for 1932. Porto Rico with an acreage estimated at 3,800 has not fully recovered from the damage resulting from the hurricane of 1928. It is reported that it will be another season before Porto Rico is again shipping as heavily as it was previous to the hurricane.

There are good prospects for a continued expansion in the foreign markets for grapefruit. In 1929 Great Britain took more grapefruit than ever before but the per capita consumption is still far behind that of the United States or Canada. Porto Rico is supplying an increasing share of the British grapefruit imports. Continental European countries are showing a greater interest in grapefruit and the outlet there will undoubtedly expand, particularly if organized efforts are made to acquaint consumers with the merits of this fruit.

The canning of grapefruit offers another marketing outlet. During the past season 957,000 cases were packed as against 455,000 in 1927. In addition canners put up 202,000 cases of grapefruit juice.

In writing advertisers please mention The Citrus Industry.

CITRUS TREES

and Bank Books

YOUR groves and your bank deposits will be healthier when you use Chilean Nitrate of Soda.

This natural nitrate fertilizer—the only *natural* nitrate in the world—is of great value in fertilizing citrus fruits. First—it gives trees a fine early start—makes sure of setting a good crop—tides trees over critical setting period.

Then, as the crop advances, Chilean Nitrate supplies the necessary nitrogen to mature your fruit early. Adds to the sugar content. Makes juicier fruit—the kind that grades higher, ships better and brings top prices.

Chilean Nitrate is not synthetic. It is the fertilizer that more than 800,000 American farmers used last year to make better crops. It pays a fine profit on citrus and other fruit trees, on truck, corn, cotton and grain. Try it this year. Now is the best time to buy it.

FREE Book for You

Our new book, "How to Fertilize Citrus in Florida," is filled with valuable crop facts. It is free. Ask for Book No. 7, or tear out this ad and mail it with your name and address written on the margin.

1830-1930—This year marks the 100th anniversary of the first cargo of Chilean Nitrate brought to the United States.

Chilean Nitrate of Soda

EDUCATIONAL BUREAU



Orlando Bank & Trust Bldg.
Orlando, Florida

In writing please refer to Ad No. 25-H

Twenty-six

NEW PREPARATIONS GIVE EFFECTIVE RESULTS

Continued from page 23

Mr. Thompson's aphicide experiments at Lake Alfred included a dust made with two per cent of Black Leaf 50 in hydrated lime. Black Leaf 50 is a solution of free nicotine in water and not nicotine sulphate, and is manufactured by the Tobacco By-Products and Chemical Corporation, of Louisville, Kentucky, the same concern that makes Black Leaf 40.

Black Leaf 50 is sold on the same nicotine basis as Black Leaf 40; i.e., it contains one-fourth more nicotine and the price is one-fourth higher. Mr. Thompson found in his experiments that a two per cent dust of Black Leaf 50 is just as effective as a three per cent dust of Black Leaf 40, which permits a considerable saving in using this aphicide. To make this dust, two pounds of Black Leaf 50, instead of three and three-fourth pounds of Black Leaf 40, is mixed with 50 pounds of hydrated lime.

Fruit Treating Process

We own the exclusive rights for the entire United States in the process of treating citrus fruit with a mixture of paraffin and gasoline or similar volatile solvent covered by

McDILL
United States Patent
No. 1,630,129
granted May 24, 1927.

To packers desiring to treat their fruit by this process we are prepared to grant the necessary permission on suitable terms. Applications will be considered in order of receipt.

Address all inquiries to

**BROGDEN, RICKETTS &
HAWORTH COMPANY**
Box No. 338
Winter Haven, Florida

THE CITRUS INDUSTRY

FLORIDA SENDS ITS CHOICEST CITRUS TO PRESIDENT HOOVER

Described as "the most perfect fruit out of a crop of more than 15,000,000 boxes," two specially packed crates of oranges and grapefruit from Florida were presented to President Hoover. Representative Herbert J. Drane, of Lakeland, Fla., made the presentation on behalf of the Florida Orange Festival of Winter Haven.

The fruit was hurried from Winter Haven to Washington by airplane, the 950 miles being covered in eight hours. Pilot Errett Williams, who carried the consignment, accompanied Mr. Drane to the White House.

CLASSIFIED

Advertisements

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

REAL ESTATE

FOR SALE—By owner, eighty acres, two-year-old best looking grove at reasonable price. Howey-in-the-Hills. For further information write "A. Z." P. O. Box 1261, Orlando, Florida.

FOR SALE—Pineapple land in winterless Florida. \$15 an acre. Almont Ake, Venus, Fla.

WANT TO SELL HALF INTEREST IN FIFTEEN ACRE SATSUMA BEARING GROVE ON HIGHWAY NEAR PANAMA CITY, ROBT. LAMBERT, OWNER FOUNTAIN, FLA.

SATSUMA BUDWOOD from Bearing Trees Hills Fruit Farm, Panama City, Fla.

WANT TO hear from owner having farm for sale; give particulars and lowest price. John J. Black, Box 98, Chippewa Falls, Wisconsin.

MISCELLANEOUS

RAISE PIGEONS—Profit and pleasure. Illustrated descriptive catalogue postage six cents. Vrana Farms, Box 314a, Clayton, Missouri.

TUNG OIL TREES—Cluster variety. Vigorous. Forty cents each. Lots of hundred \$8 cents each. Hunt Bros., Inc., Lake Wales, Fla.

FOR SALE: Splendid bearing citrus grove in Lee County, far removed from Fruit Fly infestation. Will produce 20,000 boxes coming season. If you want this grove address P. O. Box 295, Fort Myers, Fla.

DRUGS—**PREDNISOLONE** easily, inexpensively overcome without drugs. Send address. Dr. J. R. Stokes, Mohawk, Fla.

PURCHASED PULLETS FOR SALE—White Leghorns and Anconas ready to ship. Purged Rocks and R. I. Rods shortly. Several hundred yearling White Leghorn hens now laying 70%. Write or wire for prices.

February, 1930

C. A. Norman, Dr. 1440, Knoxville, Tenn.

LAREDO SOY BEANS, considered free from nematode, excellent for hay and soil improvement. Write the Baldwin County Seed Growers Association, Loxley, Alabama, for prices.

AVOCADOS - SEED — Grafted. Reliable bearers only. John B. Beach, West Palm Beach, Florida.

WANTED—To hear from owner of land for sale O Hawley, Baldwin Wis.

Tobacco By-Products & Chemical Corp. Incorporated Louisville, Ky.

March, 1930

THE CITRUS INDUSTRY

Three

TEXIDE

A petroleum base insecticide designed especially to meet the needs of the citrus grower.

KILLS APHIS



Correspondence is invited.

THE TEXAS COMPANY
Texaco Petroleum Products
District Office, Atlanta, Georgia

Texaco Agents located in citrus centers:

Orlando
Haines City
Lake Wales
Avon Park
Fort Myers

Clearwater
Dade City
Eustis
Clermont
Lakeland

Arcadia
Ocala
Tampa
Ft. Pierce
Plant City

Leesburg
Palatka
Tarpon Springs
Titusville
DeLand

Bartow
Homestead
Bradenton
Vero Beach
Miami

"Please Say You Saw It In The Citrus Industry"